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ABSTRACT

An examination of the various ways in which teaching is uncertain and how uncertainty pervades teachers' lives points out that teachers face uncertainties in their instructional content, ranging from difficult concepts, to unclarity about how teaching might be improved. These forms of uncertainty undermine teachers' authority, creating situations where they must weigh the uncertainty of teaching against the responsibility for guidanace built into the relationship between teacher and student. Attempts of teacher education programs to "prepare" teachers to face uncertainty should result in teachers' increased ability to carry out the primary functions of teaching, promotion of teachers' psychological health, and intellectual honesty within the program. Preservice teachers could be taught to expect, recognize, and understand uncertainty as well as make appropriate responses to it. Teacher education programs can promote this knowledge through such activities as: providing knowledge about uncertainty; finding out what students know about uncertainty; predicting the effects of teaching; thinking about the content of instruction; analyzing the bases of classroom authority; reflecting on learning to teach; and practicing and coaching reaction to uncertainty in real settings. (CB)

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Preparing Teachers for Uncertainty

Robert E. Floden and Christopher M. Clark

The uncertainties of teaching seem evident and inevitable. No teacher can be sure of how a lesson will go, or what a student will learn. No one can be sure which teaching approach will be most successful with a particular group of students. Casual observation and systematic research (e.g., Jackson, 1968; Lampert, 1985; Lortie, 1975) indicate that uncertainty is important to teachers' thoughts and feelings. Uncertainty is especially troubling for novice teachers.

Although writers often describe this uncertainty, little has been written about the challenges it poses for teacher education. (For medical education, however, see Fox, 1957.) Teacher educators seem eager to convince teachers that they have important knowledge to offer, and prospective teachers seem eager for solutions to practical problems of management and motivation. The residual uncertainty of teaching is an unpleasant, unacknowledged problem.

We will explore the possibility that teacher educators should face the uncertainties of teaching head on, rather than wishing that they would go away. We begin by examining the various ways in which teaching is uncertain, supplementing the standard focus on uncertainties about student learning and teaching effects with descriptions of uncertainties about subject-matter knowledge, classroom authority, and teacher learning. After discussing what it would mean to be prepared for these uncertainties, we end by considering how teacher education might foster this preparation.

We acknowledge our own uncertainty; moreover, our analyses and

proposals are probably incomplete and inadequate. We hope that others will show how our presentation should be extended, changed, or replaced.

Uncertainty in Teaching

Perhaps teacher educators have neglected uncertainty because they are unaware of how it pervades teachers' lives. Published research maps only part of uncertainty's realm. Teachers can never be sure how student understanding is changing, let alone about whether what they do will have its desired effects on student learning. Moreover, teachers face uncertainties in their instructional content, ranging from difficult choices about what to teach, to imperfect understandings of difficult concepts, to unclarity about how teaching might be improved. Together, these forms of uncertainty undermine teachers' authority, creating situations in which they must weigh the uncertainty of teaching against the responsibility for guidance built into the relationship between teacher and student.

Uncertain Assessments of Student Understanding

Student learning is a primary goal of teaching. So it is especially troubling that teachers are seldom sure what their students know and what they are learning. That skeptical claim rests on an appreciation of the limits of educational measurement and on the surprising power of children's own conceptions about subject matter.

No test is perfectly reliable and valid. Hence any non-trivial inference a teacher (or anyone else) draws from a child's test performance is open to the possibility of error. A mistake may indicate carelessness or fatigue. A correct answer may be no more than a lucky guess or a fortunate misunderstanding of the question.

The difficulties of determining what students know is compounded by

the powerful human capacity for constructing sensible interpretations of situations. Cognitive psychologists suggest that the meaning in a situation is not a given, to be understood in the same way by every moderately intelligent individual. Instead, individuals construct meaning, drawing on their personal, sometimes idiosyncratic, prior beliefs. The meanings different individuals construct are compatible enough to provide smooth social interactions; but the chance of significant variations makes teachers unsure that students understand an explanation in the same way the teacher does.

Studies of students' subject matter conceptions provide dramatic examples of the mis-assessments of student knowledge that stem from these difficulties. One especially striking example is a study of a student named Benny (Erlwanger, 1973). Benny's test results appeared to show above-average mastery of mathematics; but he turned out to have constructed a bizarre system of mathematical computation. Benny's ideas about how to compute with fractions illustrate his non-standard interpretation of mathematics. Benny understood 1.5 to be the same as 1/5. Benny reconciled differences between his own understandings and the correct test answers by an expanded idea of which numbers are equivalent. Just as 1/2 is equivalent to 2/4, he reasoned, his answer was probably the same as that given in the book. The difference between teacher and student understanding remained invisible to both student and teacher, despite the fact that Benny was regularly tested.

Uncertain Effects of Teaching

Even if teachers had a good idea of how much students knew, it would be hard to predict the outcomes of any class activity. The effects of teaching, like the effects of most human interactions, are

difficult (perhaps impossible) to predict in particular instances. The lesson that has always excited students, for example, can flop with this year's class. Systematic research on teaching can contribute to teachers' understandings of their students, but it has not, and probably never will, permit accurate prediction of what this child will learn from this lesson taught in this way by this teacher in this school.

Uncertain Support for Instructional Content

Instructional content--the things that teachers hope their students will learn about mathematics, history, or literature--holds several uncertainties. Take, for example, the choice of what content will be included. Some bounds may (or may not) be set by explicit guidelines, available instructional materials, and agreements with other teachers. The individual teacher, however, inevitably faces important, difficult decisions about coverage and emphasis. These range from, at one extreme, global choices between an orientation towards facts and rules or one toward relationships among concepts and broad understanding, to, at the other extreme, whether or not to spend time on a specific topic. Because plausible objections can be made to any curriculum choice, teachers always face uncertainty about their decisions.

Uncertainties about instructional content are multiplied by teachers' own imperfect understandings of the fields they will teach. It is no scandal that the typical high school teacher knows less than the Nobel laureate, or that the typical elementary school teacher knows less about ecosystems than the typical high school biology teacher. But high school teachers' certainty about the concepts they must teach will be eroded by the recollection that some topics seemed elusive when studied in college. The range of content in the school curriculum,

coupled with the relatively short time that content is studied by college undergraduates, implies that teachers can expect to teach some things about which their own understanding falls short of the best scholarship in the field.

Further study will not bring certainty about instructional content. The farther one goes in studying a subject, the more opportunity one has to see ongoing disputes, disputes that often run near the heart of an area, and that may have little chance of resolution. Some scholars, such as Thomas Kuhn, would go so far as to say that the disputes will be settled by politics or charisma, rather than by appeals to reason.

The Teacher's Uncertain Authority

The three sources of uncertainty discussed above lead to a fourth source, an overarching uncertainty about the teachers' role as a social and intellectual authority in the classroom. Recognizing their weak intellectual footing, teachers may not feel justified in contradicting pupils who assert their own view of what they should be studying. Teachers are unsure about how much students already know, about what will happen if students go along with the planned lesson, and about whether the claims in the text are really the last word on the subject at hand. Who is the teacher to say what students should do or learn?

The authority relationship between teacher and student is further constrained by teachers' moral obligation to respect the personal autonomy of students. Because students are human, they have the right to hold opinions about matters of personal choice. Yet the teacher has a potentially conflicting obligation to help shape students' logical and aesthetic standards for judgement. This tension between preserving autonomy and exercising authority cannot be neatly resolved, hence

teachers remain uncertain about the course they should pursue and the appropriateness of their actions.

Uncertainty About Learning to Teach

Just as they are unsure of what their students know and can learn, teachers are uncertain about their own capacities. One special case is teachers' uncertainty about their own uncertainty. From the perspective of learning to teach, uncertainties are of three types. Some uncertainties show individual ignorance, and will vanish with additional education and experience. Others are shared by most experienced teachers, but will ultimately be eliminated as educational knowledge grows. Still others are inevitable; these are and always will be present, for individual teachers and for the occupation as a whole. Each type suggests a different course of action for the teacher, but teachers, particularly beginning teachers, may have difficulty distinguishing among them, hence may be uncertain whether a particular uncertainty can be eliminated by concentrated individual study and effort, or must be accepted as a fact of occupational life.

What Would It Mean To Be Prepared for Uncertainty in Teaching?

Before considering what teacher educators might do to prepare teachers for uncertainty, we must consider what "prepared for uncertainty" means. "Prepare" means to make ready or disposed in some way; "ready" means in a fit state or provided beforehand (Oxford Dictionary of Current English). The ordinary meaning of the term, "prepare," thus suggests that "being prepared for uncertainty" in teaching means being in a suitable, proper, or appropriate state for uncertainty before it is encountered, and perhaps being disposed to act

in a fit manner. But what states or dispositions are appropriate?

We suggest three general criteria of appropriateness. First, appropriate states and dispositions should increase teachers' abilities to carry out the primary functions of teaching (e.g., promoting learning). Second, they should promote teachers' psychological health. Third, they should embody intellectual honesty (i.e., they should not be based on self-deception, brainwashing, etc.).

We can justify each criterion. The first criterion is tied to appropriateness for teachers as teachers; what is appropriate might be different for tailors, tax preparers, or truck drivers. The second criterion is tied in an equally obvious way to appropriateness for teachers as people. The third criterion may be more controversial. Its support comes from the argument that, because it is desirable for pupils to hold justified beliefs (rather than merely memorizing facts or taking things on faith), teachers should, as a general principle, try to get students to believe what they are taught for reasons suited to their ability and knowledge (Bruner, 1960; Scheffler, 1960; Strike, 1982).

Using these three criteria, we can quickly see that some states and dispositions are inappropriate. Ignorance of teaching's uncertainties is intellectually dishonest, so teachers who are ignorant of uncertainty are not prepared for it. Psychological states like shock, depression, guilt, paralyzing self-criticism, and resentment (often directed at teacher educators who "didn't prepare me for reality") violate the second criterion. All such states can also lead to a conservative, literal, and inflexible approach to teaching in which the afflicted teachers delegate their instructional responsibilities to the textbook and attribute failure to student characteristics and lack of effort. Thus these states would violate the first criterion as well.

Laying out a positive picture of preparedness is harder than clearing the ground of states and dispositions that show lack of preparedness. We can, however, make a start.

Since teacher education cannot eliminate uncertainty, intellectual honesty requires that any state or disposition be based on some recognition and understanding of uncertainty, and on the expectation that it will be present in any teaching situation. In other words, recognizing, expecting, and understanding uncertainty are required for preparedness.

Preparedness also requires the disposition to act in ways that promote either the primary functions of teaching or teachers' mental health. These ways of acting include: taking "best bet" actions; seeking greater certainty where it is readily available; building peer support for coping with uncertainty; and, maintaining an intellectually honest aura of certainty. This is a list of strong candidates, not an exhaustive catalogue. This incomplete list, together with recognizing, expecting, and understanding uncertainty, forms an initial basis for preparing teachers for uncertainty.

Expecting, Recognizing, and Understanding Uncertainty

Preservice teachers probably neither expect, recognize, nor understand uncertainty. Constructivist views of student and expert knowledge, for example, are at odds with the commonly held conception that children will understand anything that is clearly explained, and that the curriculum has the unproblematic character of received truth, scientifically and permanently proven.

Unfortunately, appreciating the extent of uncertainty can be unsettling. The danger of inducing despair complicates plans for

teacher preparation. For example, knowledge must be provided while simultaneously avoiding the common inappropriate inclination to abandon responsibility for serious thought about educational decisions, on the grounds that the uncertainties of teaching preclude all right answers, hence all bases for reasoned choice. Unexamined relativism or the cynical position that "anything goes as long as you can come up with a reason" confuses uncertainty with anarchy.

Such relativism should be avoided. Compared with a typical elementary or secondary school student, teachers know more about instructional content, including the content's worth. Teachers may not be sure of what to teach or why, but they have better grounds for assessing choices than do students. Uncertainty militates against dogmatism, but it is no excuse for anarchy. Teacher education must therefore work to educate teachers about uncertainty, without throwing them into inappropriate and unnecessary states of discouragement and despair.

Appropriate Responses to Uncertainty

The actions promoting either the main functions of teaching or teachers' mental health include: taking "best bet" courses of action; seeking greater certainty (where it is likely to be had for reasonable effort); building peer support for coping with uncertainty; and, maintaining a reassuring, yet intellectually honest, aura of certainty.

Taking best bets. Decision theory, a general approach to promoting given aims under uncertain conditions, can be adapted to promoting primary teaching functions, such as fostering student learning. It provides strategies for choosing actions that take account of several possible scenarios, with their associated costs, benefits, and

likelihoods. This approach requires knowledge of the overall strategy (e.g., how to compute expected gains and costs), as well as skill in estimating probabilities, costs, and benefits. Even with only approximate estimates and casual assessments, this approach can often lead to reasonable responses.

For example, suppose a teacher has given students directions for completing an unusual written assignment. A teacher who was prepared for the uncertainties of teaching might then consider how various possible actions would affect the chances of several plausible outcomes, with associated costs and benefits. One course of action would be to devote no more class time to this assignment; another would be to spend more time explaining the assignment; a third would be to let students start working on the assignment, then see how well students' initial efforts match the teacher's image of the assignment. The chance that students do understand what they are supposed to do would be different in each case, as would the costs to the teacher and students, and the benefits to each. By combining those factors and using a decision rule, the teacher could make a decision that responds to the conditions and uncertainties of the situation.

This "best bet" approach leads to having realistic goals for teaching. Rather than assuming that teaching plans will be carried through, with the best possible outcome, it anticipates departures from the ideal plan, each with positive and negative consequences. Robust plans--plans that can lead to desirable learning under a wide variety of possible modifications--anticipate changes, and are thus more likely to be best bets. Expecting uncertainty, change, and interruption may help teachers to ask questions of themselves and of their plans that lead to

more robust, flexible plans and instructional routines.

Seeking greater certainty where appropriate. Seeking greater certainty can also promote main teaching functions in situations of uncertainty. It not appropriate, however, when greater certainty is impossible, too costly, or too time-consuming. But, in other cases, seeking additional information from colleagues, books, or even from students can reduce uncertainty and thus permit better teaching choices. Preparation for uncertainty includes both knowing how to reduce uncertainty and knowing when to try.

One aspect of this preparedness is being alert to information that would contradict assumptions. Another is developing a sense of when it is worth the cost to work for greater mastery of an instructional topic.

Building peer support. Stress is a psychological side effect of living with uncertainty. Doubts about one's knowledge and effectiveness can add to the psychic and emotional costs of an already demanding job. Hence, promoting professional support among teachers is an appropriate response to uncertainty, because it promotes teachers' mental health. Simply having teachers remind each other of the endemic uncertainties of their work may reduce inappropriate feelings of individual failure. Reassurance that one has taken the best bet may encourage making further appropriate responses, rather than succumbing to depression.

When does honesty require admission of doubt? Uncertainty need not imply indecision. Each of the appropriate responses just discussed calls for action, rather than hesitation or paralysis. Decisive action, however, may give the appearance of certainty. The illusion of certainty created by decisive action has benefits for students and parents. Students can throw themselves wholeheartedly into their studies if they believe in their teachers' competence.

But, given the awareness of uncertainty, is this mask of assurance intellectually honest? It would be dishonest if teachers acted as though their actions could never be questioned. Constant profession of doubt would, however, itself be dishonest. Teachers may not always make the best decision, but they are right enough, often enough, to justify confidence in their decisions. Honesty requires due consideration to objections and questions, but not necessarily answers to them all.

Can Teacher Education Prepare Teachers for Uncertainty?

Since teacher education is at least as uncertain an occupation as teaching, it would be foolish to express certainty about teacher education curriculum, or even about uncertainty's importance. We can, however, make some reasonable bets about teacher education approaches.

The tasks to be suggested will be variations on familiar teaching devices, rather than completely new approaches to teacher education. Preparation for uncertainty is not the only goal of teacher education, so this preparation must represent an adjustment in existing teacher education practice, rather than a radical replacement.

Attention to uncertainty could be incorporated into most of the tasks prospective teachers are typically given as part of their formal preparation. The ubiquity of uncertainty in teaching implies that virtually any task related to teaching can be adapted so that it provides encouragement to see and deal with uncertainty, and so that it gives some opportunity to practice appropriate responses to uncertainty.

We can suggest some general strategies for incorporating preparation for uncertainty into existing teaching tasks. First, tasks could make uncertainty salient and ask prospective teachers to indicate, defend, and perhaps carry out a response to that uncertainty.

Uncertainties can be made salient in a variety of ways. The task could itself require that prospective teachers identify and describe elements of uncertainty, perhaps with prompting from the teacher educator. A question could follow about which appropriate actions would be appropriate and why. Having to defend a position can raise awareness of gaps and doubts about hitherto unconsidered beliefs.

Second, tasks could be used directly to shape norms about when and where to seek additional information. Although elementary and secondary school experience may discourage students from asking for help or seeking additional resources, teachers may often appropriately seek assistance and support. Teacher educators can try to modify prior habits and expectations by indicating that, in learning to teach, the range of resources is wider, including books, experienced teachers, and fellow novices. Coauthoring, teamwork in class presentations, and use of guest experts in teacher education courses are some ways in which this response to uncertainty might be modeled.

Third, tasks for prospective teachers can be amended by requiring our students to apply course concepts to themselves as learners, specifically to their learning to teach. By examining and observing themselves as learners, they can often see the difficulties facing their teachers. In taking this perspective, they can become acutely aware of the limited effects their teacher educators can have, of the misunderstandings that may occur, and of the apparent differences between what teacher educators hope to accomplish and what teacher candidates learn. Such reflection can heighten awareness of uncertainty in teaching and learning.

Providing Knowledge About Uncertainty

In courses under the standard rubrics of educational foundations (e.g., educational psychology, philosophy of education, educational testing), content could be oriented towards preparation for uncertainty. We can describe what that content might be for each of the sources of uncertainty discussed early in this paper: uncertainty about what students are learning, uncertainty about the effects of particular teaching strategies, uncertainty about the subject matter to be taught, uncertainty about the teachers' classroom authority, and uncertainty about how to improve teaching practice.

Finding out what students know. Instruction about uncertainty has a place in educational psychology courses. In discussions of school learning, the constructivist view highlights the teacher's uncertainty about what the child knows and how the teacher can foster learning. Because learning is an active process of selecting and reorganizing information, students learn, not what teachers say, but the meaning students construct from what they hear. Active construction, grounded in prior beliefs, leads to uncertainty about what children are learning. Introduction of the basic educational measurement concepts of reliability and validity could also increase understanding of uncertainty.

Predicting the effects of teaching. Though some champions of the research knowledge base for teaching might claim that including research results in teacher education will give teachers a firm footing, it seems more likely that including research will do quite the opposite. Researchers themselves have been repeatedly struck by the complexity of the teaching task, a complexity than seems to defy permanent mastery. Furthermore, researchers sent on quests for the best teaching method

have repeatedly returned with the news that selection of a teaching method must be tailored to specific circumstances and particular teaching goals.

Including research on teacher thinking in the undergraduate curriculum helps undergraduates let go of the mistaken impression that good teachers are certain of everything that matters. This literature details the invisible ways in which experienced teachers cope with the intrinsic uncertainties of teaching and learning through their planning, interactive decisionmaking, and dilemma management (e.g., Clark & Peterson, 1986; Clark & Lampert, 1986).

Thinking about the content of instruction. Preservice teachers often recognize their own uncertain command of the disciplines they will teach. They are less aware of the uncertainties that remain even for the most advanced thinkers in their field, or of the possible gaps in classical proofs and demonstrations. Including topics from the "new" philosophy of science and philosophy of mathematics can show the sources of fundamental uncertainties about knowledge. Though perhaps an extreme case, Kuhn's claims that shifts between theories are based as much on politics and charisma as on hard data and clear thinking, alerts prospective teachers to the idea that knowledge in disciplines, like children's knowledge, is in part a fallible human construction. This position gains credibility when taught in conjunction with constructivist psychology.

Another preconception of many prospective teachers is that the content they will teach is a given, completely determined by others. They have no expectation that they will be asked to make curriculum decisions, or perhaps even that curriculum decisions remain to be made.

Teacher educators can raise awareness of this arena of uncertainty by including attention to the problematic nature of curriculum choice, and to research that has shown that, even in school systems with relatively tight central control, teachers still must exercise considerable curricular judgment (Schwille et al., 1983).

The bases of classroom authority. Analyses of intellectual and social authority are part of the standard domains of the philosophy of knowledge and of social theory. Although authority is not an issue incorporated into every introductory philosophy of education course, material is available that considers these topics in the context of classroom teaching. Strike (1982) provides a straightforward account of the bases for teachers' authority, both about their instruction and about their rules for classroom behavior. Such accounts can give prospective teachers some rationale for continuing to shoulder responsibility for reasoned classroom behavior and responsibly adaptive school curriculum, despite the doubts raised by considerations of other sources of uncertainty.

Reflecting on learning to teach. The teacher education curriculum typically does not provide special instruction about learning to teach. Though learning to teach remains a relatively neglected research area, enough work has been done in the last decade (see, Doyle, 1985; Nemser, 1983; Ryan, et al., 1980; Zeichner & Tabachnick, 1985) to give novices descriptions they can compare with their own expectations and experiences. These studies, together with classic theoretical discussions of teacher education (e.g., Dewey, 1904/1965), can help students to recognize challenges to the common assumption that trial and error will teach them everything they need to know.

Knowledge of Uncertainty is Not Enough

Though skills can learned by trial and error, it is a great advantage to begin by copying another's skilled performance. Thus, training for uncertainty should include opportunities for novices to observe appropriate ways of responding to uncertainty. "Live" demonstration can be provided by teacher educators (both college faculty and school supervising teachers). Models could also be provided through tape recordings or written case studies.

Teacher educators have regular opportunities to model and articulate appropriate responses to uncertainty. But, to be instructionally effective, they must do more than live these virtues; they must exhibit them in ways that their students can understand. When teaching prospective teachers, teacher educators need to "think aloud" as they make teaching decisions, deciding: whether to speed or slow the pace of instruction, when and how to seek further certainty before deciding or acting, and so on.

Practice in Safe Settings

Particularly when first acquiring a skill, practice in a simplified setting permits concentrating on a particular aspect of performance. When teaching a room full of children, for example, the multiple demands on the teacher's attention make it hard to focus on doing something new. Indeed, the need to maintain class control makes it hard to even try something new, particularly for novice teachers. To help develop skills for dealing with uncertainty, therefore, teacher education should provide opportunities to practice in situations less demanding than full-fledged classroom teaching.

One way to reduce the complexity of teaching is to reduce the

number of students and the breadth of content. Such simplification would, for example, facilitate practicing the skill of maintaining and air of assurance while remaining honest about underlying uncertainties.

Another way to reduce complexity is to increase the time available for a teaching task by simulating it. We illustrate this approach with a task we have developed and used in a teacher education program. In this task, prospective teachers are required: to identify a short test intended to assess understanding of some commonly taught concept, to describe what inferences they think can be drawn from this test, to analyze the difficulties in drawing such inferences, and to describe what the teacher could realistically do to handle these difficulties.

Students begin this assignment by looking through several textbooks in the subject they plan to teach, first choosing a focal concept, then selecting test items that seem to assess pupils' understanding of that concept. Students put together a short (e.g., ten minute) test, so that their analyses can treat each test item in depth.

Students must then imagine different answers pupils might give on the test, and say, for each set of answers, what a teacher might reasonably infer about pupil understanding of the concept. The central task of this assignment is to then discuss those inferences, particularly data and ways of thinking that might give rise to inappropriate, incorrect, or unjustifiable inferences. In addition to mistakes such as carelessness, pupil fatigue, or lucky guesses, students are expected to imagine student misconceptions that might nevertheless lead to correct answers. In thinking of such problematic inferences, students are encouraged to draw on clinical interviews they have conducted with pupils; such interviews often show surprising discrepancies between pupils' understanding of a concept, and the

understanding that might have been inferred from examining performance on a brief examination. This task can build student awareness of uncertainty, because it shows that inferences that teachers might ordinarily take as valid may yet be in error.

Finally, to give students the opportunity to think through how they might deal with uncertainty, the assignment requires students to discuss what the teacher might realistically do, given the doubts that must remain about any inferences drawn from tests. The word, "realistically," is important, because it signals that options like "interview the child in depth about this concept," are inadmissible. Because this hypothetical situation is both slower paced and less emotionally charged that an actual teaching situation, students are more likely to suggest appropriate responses such as being alert for specific indications of misunderstanding, combining test data with other sources of evaluative information, and building other ways of teaching the concept into further instruction.

Coaching in Real Settings

The remaining component of skills training is coaching in real teaching settings. Skills must always be adapted to particular settings, and that process of adaptation can be improved with the assistance of someone who observes and comments on the performance (Joyce & Showers, 1984). This means extending attention to uncertainty into student teaching and into the induction years. Here novices explore how the best bets in day-to-day teaching are different from those of microteaching, how the efforts to foster support from colleagues is different from efforts to gain support from fellow novices, and so on. The coaches, be they college supervisors,

cooperating teachers, or school mentors, can make suggestions about the modifications needed, and can also encourage the novice to maintain the skills in this new, more challenging, setting. Without the support of such coaching, and without some prior supervised practice in responding appropriately to uncertainty, student teachers and novice teachers are likely to be thrown back on the inappropriate impressions and preconceptions derived from their own school days.

Summary

For teachers, uncertainty is a pervasive fact of working life. They face uncertainty about what their students are learning, about the effects they have on students, about the subjects they teach, and about their own authority in the classroom. Prospective teachers can easily get the impression that these uncertainties will disappear as they gain experience. Much has been written about some of these teaching uncertainties, but there is little literature suggesting ways teacher educators can help prepare teachers for uncertainty. We have begun to meet this need by reviewing the sources of uncertainty, putting forward an analysis of the constituents of preparedness, and indicating some ways in which teacher educators might work toward such preparedness.

Our analysis is suggestive, not definitive. True to our subject, we have stated our case firmly, but remain uncertain about its accuracy, completeness, and importance. Preparation for uncertainty is not the central goal of teacher education; knowledge of academic subjects, pedagogical skill, and an understanding of children are all stronger candidates. But inasmuch as preparation for uncertainty pervades each of these, it deserves our serious attention.

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